

CLAIMS

1. An electric circuit for use as a radio receiver or as part of a radio receiver, the electric circuit comprising:
  - amplification means for receiving an analogue input signal;
  - analogue frequency mixer means for receiving an output of the amplification means, the mixer means being configurable to down-convert a wanted component of the amplified input signal to one of at least two intermediate frequency bands;
  - analogue filter means for receiving an output of the frequency mixer means, the filter means being switchable between at least two filter configurations;
  - and
  - control means coupled to the frequency mixer means and to the filter means for selecting an intermediate frequency band and filter configuration appropriate to the input signal.
2. An electric circuit according to claim 1, the frequency mixer means comprising a plurality of mixers being switchable into and out of use in order to allow configuration of the frequency mixer means, at least one of the mixers being reused for different configurations of the frequency mixer means.
3. An electric circuit according to claim 2, the frequency mixer comprising four mixers configurable to provide at least two of:
  - a quadrature mixer for zero-IF use; and
  - a fully complex mixer for low-IF use; and
  - a single real mixer for superheterodyne use.
4. An electric circuit according to any one of the preceding claims, wherein the filter means comprises a set of interconnected circuit elements, and switches which modify the interconnections between the circuit elements.
5. An electric circuit according to any one of claims 1 to 3, wherein the filter means comprises a set of interconnected circuit elements, and means for providing

adjustable bias signals or connections internal to the circuit elements, so as to substantially change their operating point or transfer function of the filter means.

6. An electric circuit according to any preceding claim, wherein one of said filter  
5 configurations is a low pass configuration for zero-IF use.

7. An electric circuit according to any preceding claim, wherein one of said filter configurations is a complex bandpass configuration for low-IF use.

10 8. An electric circuit according to any preceding claim, wherein one of said filter configurations is a real bandpass configuration for superheterodyne use.

9. An electric circuit according to any preceding claim, wherein the control means is capable of selecting an intermediate frequency band and filter configuration  
15 so that the circuit operates in heterodyne mode.

10. An electric circuit according to any one of the preceding claims, wherein the filter means provides quadrature inputs and quadrature outputs, the filter means being switchable to allow feedback to be passed from the quadrature outputs to opposite  
20 quadrature inputs.

11. An electric circuit according to any one of the preceding claim, wherein the filter means comprises amplifiers and integrators arranged to simulate a passive filter, the time constants of the integrators being adjustable to adjust the filter means' transfer function.  
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12. An electric circuit according to claim 10, wherein the integrator is a transconductor capacitor structure having a tuneable bias current

30 13. An electric circuit according to any preceding claim, wherein the filter means comprises transconductors and capacitors arranged to form active gyrators.

14. An electric circuit according to claim 13, wherein the transconductors are provided with tuneable bias currents, and the capacitors are provided with switches which may be used to switch the capacitors into or out of the filter active gyrators.
- 5 15. An electric circuit according to any preceding claim, wherein the filter means implements an all-pole lowpass filter.
16. An electric circuit according to any of claims 1 to 14, wherein the filter means implements an elliptic filter.
- 10 17. An electric circuit according to claim 15 or 16, wherein the filter means is dynamically reconfigurable between the all-pole lowpass filter implementation and the elliptic filter implementation.
- 15 18. An electric circuit according to any preceding claim, wherein the dynamically reconfigurable filter means is implemented in the analogue domain
19. An electric circuit according to any of claims 1 to 8, wherein the dynamically reconfigurable filter means is implemented in the digital domain.
- 20 20. An electric circuit according to claim 19, wherein the filter means comprises a finite input response filter with adjustable delay sections and weights.
21. An electric circuit according to claim 18 or 19, wherein the analogue  
25 dynamically reconfigurable filter means and the digital dynamically reconfigurable filter means are both provided in the electric circuit.
22. An electric circuit according to any one of the preceding claims and comprising detection means coupled to receive at an input the output of the filter  
30 means for extracting modulation information therefrom, the detection means being coupled to the control means so that the control means can switch the detection means between at least two operating modes.

ART 34 AMDT

23. An electric circuit according to claim 22, wherein the detection means can be switched between at least a real value and a complex modulus operating mode.
24. An electric circuit for use as a radio receiver or as part of a radio receiver, the electric circuit comprising:
- amplification means for receiving an analogue input signal;
  - analogue frequency mixer means for receiving an output of the amplification means, the mixer means comprising a plurality of mixers which can be configured to provide mixer operation in a plurality of modes, at least one of the mixers being reused in different operating modes;
  - analogue filter means for receiving an output of the frequency mixer means, the filter means being switchable between at least two filter configurations; and
  - control means coupled to the frequency mixer means and to the filter means for selecting a frequency mixer means operating mode and filter configuration appropriate to the input signal.
25. An electric circuit according to claim 24, wherein said filter means comprises a plurality of filters which can be switched into and out of use, at least one of the filters being reused in different filter configurations.
26. An electric circuit for use as a radio receiver or as part of a radio receiver, the electric circuit comprising:
- amplification means for receiving an analogue input signal;
  - analogue frequency mixer means for receiving an output of the amplification means;
  - analogue filter means for receiving an output of the frequency mixer means;
  - and
  - control means coupled to the frequency mixer means and to the filter means and capable of selecting a frequency mixer means operating mode and filter configuration appropriate to the input signal to provide each of a low-IF, zero-IF and superheterodyne architecture.